

I (WE) CLAIM:

1. A system for preventing damage to a capacitive membrane ultrasound transducer, the system comprising:
 - a membrane;
 - a conductor connected with the membrane; and
 - a voltage limiting circuit connected with the conductor.
2. The system of Claim 1 wherein the membrane comprises a flexible membrane adjacent a void and the conductor comprises an electrode on the flexible membrane and a signal trace connected with the electrode.
3. The system of Claim 1 wherein the voltage limiting circuit comprises at least one Zener diode connected between the conductor and a ground.
4. The system of Claim 3 wherein the at least one Zener diode comprises two Zener diodes in series with opposite polarities.
5. The system of Claim 1 wherein the voltage limiting circuit comprises:
 - a first voltage source; and
 - a first diode connected between the conductor and the first voltage source.
6. The system of Claim 5 wherein the voltage limiting circuit further comprises:
 - a second voltage source with a negative voltage, the first voltage source having a positive voltage;
 - a second diode connected between the conductor and the second voltage source.
7. The system of Claim 1 further comprising:
 - first and second electrodes associated with the membrane;

wherein the voltage limiting circuit comprises a switch operable to short the first electrode to the second electrode.

8. The system of Claim 7 wherein the switch comprises a relay.

9. The system of Claim 1 wherein at least one component of the voltage limiting circuit is within a transducer probe.

10. The system of Claim 9 wherein the at least one component is integrated with a preamplifier.

11. The system of Claim 1 wherein at least one component of the voltage limiting circuit is within a transducer connector of an imaging system.

12. A method for preventing damage to a capacitive membrane ultrasound transducer, the method comprising:

- (a) generating one of acoustic and electrical signals with variation between a first electrode on a membrane and a second electrode; and
- (b) limiting a voltage between the first and second electrodes with a protection circuit.

13. The method of Claim 12 wherein (b) comprises holding a voltage between the first and second electrodes substantially constant where the voltage may exceed a breakdown voltage of the membrane.

14. The method of Claim 12 wherein (b) comprises draining current away from at least one of the first and second electrodes, wherein the drain in current limits a voltage difference between the first and second electrodes.

15. The method of Claim 12 wherein (b) comprises limiting the voltage with at least one Zener diode connected between one of the first and second electrodes and a ground.

16. The method of Claim 12 wherein (b) comprises limiting the voltage with a first voltage source and a first diode connected between one of the first and second electrodes and the first voltage source.

17. The method of Claim 12 wherein (b) comprises shorting the first electrode to the second electrode at time other than during performance of (a).

18. The method of Claim 12 wherein the protection circuit is within a transducer probe.

19. The method of Claim 18 wherein (b) comprises limiting with the protection circuit integrated with a receive preamplifier.

20. A system for preventing damage to a capacitive membrane ultrasound transducer, the system comprising:

the capacitive membrane ultrasound transducer; and
a high voltage protection circuit connected with the capacitive membrane ultrasound transducer.

21. The system of Claim 21 wherein the high voltage protection circuit connects between the capacitive membrane ultrasound transducer and a preamplifier within a transducer probe.